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Description

Inserting Device and Method for Inserting Inserts into Envelopes

Background of Invention

[0001] 1. Field of the Invention.

[0002] The invention relates to an inserting device comprising at least one transport device for supplying envelopes to at least one station arranged downstream and comprising at least one transport element for the envelopes. The invention also relates to a method for inserting inserts into envelopes, particularly by means of the inserting device of the aforementioned kind, with which the envelopes are opened sequentially, are provided with the insert, and are subsequently closed.

[0003] 2. Description of the Related Art.

[0004] Inserting devices are known where the envelopes are sequentially removed by the transport device from a magazine and are then supplied to the actual inserter. In the

inserter, the inserts are then pushed into the open envelope, and the envelope is closed at a further station of the inserting device. The output of such an inserting device is limited.

Summary of Invention

[0005] It is an object of the present invention to configure the inserting device of the aforementioned kind and the method of the aforementioned kind such that the envelopes are passed in a simple and reliable way with high output through the inserting device.

[0006] In accordance with the present invention, this is achieved in regard to the inserting device in that the envelopes are deposited in the at least one station arranged downstream in an overlapped arrangement. In accordance with the present invention this is achieved in regard to the method in that the envelopes, before insertion of the insert, are positioned so as to overlap one another and are then supplied in the overlapped arrangement to the inserter.

[0007] With the inserting device according to the present invention, the envelopes, before being filled with the inserts, are arranged so as to overlap one another. This overlap arrangement can be an imbricated arrangement (staggered overlap) but also without an arrangement with-

out staggering, i.e., a stacked arrangement. As a result of this overlap arrangement, the envelopes can be supplied in a rapid sequence one after another to the inserting station (inserting unit). The inserting device according to the present invention has therefore a high output. However, there is also the possibility to operate the inserting device according to the invention more slowly as a result of the overlap arrangement of the envelopes so that the same output as with conventional inserting devices is achieved but with significantly increased reliability during the inserting process.

[0008] In order for the inserts to be reliably inserted into the envelopes at the inserting station, according to another configuration of the present invention, the transport element of the transport device is twisted in the area of the downstream station of the inserting device according to the invention. As a result of this twisted arrangement, the transport element, which is configured to circulate endlessly, has the effect that between the closure flap and the remaining part of the envelope a free space or an opening is formed during transport of the envelope; a catch rail can engage this free space or opening upon further transport of the envelope. This catch rail ensures reliably that

the closure flap will open upon further transport of the envelope.

Brief Description of Drawings

[0009] Fig. 1 is a schematic illustration of the inlet area of the inserting device according to the invention.

[0010] Fig. 2 shows schematically in a plan view the inserting area of the inserting device according to the invention.

[0011] Fig. 3 shows a side view of the inserting area of the inserting device according to the invention according to Fig. 2.

[0012] Fig. 4 shows a transfer device of the inserting device according to the invention in a side view.

[0013] Fig. 5 shows an axial section of the transfer device according to Fig. 4.

[0014] Fig. 6 shows in a side view, similar to Fig. 3, the inserting area with individually supplied envelopes which, when entering the transfer area, are arranged in a stack with overlap.

[0015] Fig. 7 is a view similar to Fig. 6 in which the envelopes are however supplied in an imbricated flow.

[0016] Fig. 8a shows in a front view the opening action of the envelope in the inserting area by means of suction devices as well as pivotable guide elements introduced into the

corner areas of the envelope for providing a taut opening position for the closure flap.

[0017] Fig. 8b shows a plan view of the opening action of Fig. 8a.

[0018] Fig. 9a shows a view similar to Fig. 8a where however the guide elements have been pivoted into the corner areas of the envelope and keep them open in a taut position.

[0019] Fig. 9b is a view similar to Fig. 8b with the guide elements in the position of Fig. 9a.

[0020] Fig. 10a shows in a view similar to Figs. 8a and 9a the guide elements, after the envelope has been released by the suction devices, being pivoted back slightly in order to relieve the tension provided in the corner areas of the envelope.

[0021] Fig. 10b shows a view similar to Figs. 8b and Fig. 9b with the guide elements in the position of Fig. 10a.

[0022] Fig. 11a shows a U-shaped guide element in a front view.

[0023] Fig. 11b shows the U-shaped guide element of Fig. 11a in a side view.

[0024] Fig. 11c shows the U-shaped guide element of Fig. 11a in a plan view.

[0025] Fig. 12a shows a V-shaped guide element in a front view.

[0026] Fig. 12b shows the V-shaped guide element of Fig. 12a in

a side view.

[0027] Fig. 12c shows the V-shaped guide element of Fig. 12a in a plan view.

Detailed Description

[0028] The inserting device is used to insert inserts into envelopes and close the envelopes subsequently. The individual envelopes 1 are individually supplied from a magazine 2 to an inlet area 3 of the inserting device. In the inlet area 3 a transport device 4 is provided with which the envelopes 1 are individually supplied to a transport station 5. In the transport station 5, the open envelopes 1 can be arranged already in an imbricated overlap arrangement and can be transported farther in this overlap position.

[0029] The transport device has two shafts 6, 7 arranged above one another. The shafts 6, 7 are rotatably driven and are positioned vertically at a spacing above one another. Advantageously, the two shafts 6, 7 are positioned at a slant relative to a horizontal plane. The slant angle is, for example, 30 degrees. An endless circulating transport band or endless circulating transport belt 8 is guided about the two shafts 6, 7; the transport belts or bands are used for supplying the envelopes to the transport station 5 in a

way to be described in the following. Approximately at the level of the lower shaft 7, an additional shaft 9 is provided across which the transport belt 8 is guided. The shaft 9 is positioned at an acute angle relative to the shaft 7 so that the two axes of the shafts 7, 9 are not positioned in a common plane. As a result of this slanted arrangement of the shaft 9, the transport belt 8 is in a twisted arrangement, as illustrated in Fig. 1. In the area of the lower shaft 7, the upper run of the transport belt 1 is deflected by approximately 90 degrees. For this purpose, a guide roller 10 is provided whose axis 11 extends parallel to the shafts 6, 7. The guide roller 10 has a significantly greater diameter than the shafts 6, 7. The transport belt 8 in the illustrated embodiment rests about an angular area of approximately 90 degrees against the guide roller 10. The envelopes 1 are transported between the transport belt 8 and the guide roller 10 in the direction toward the transport station 5. The transport belt 8 is deflected at the lower shaft 7 by 90 degrees relative to the shaft 9.

[0030] In order for the envelopes 1 located in the magazine 2 to be supplied to the inlet area 3, at least one transport roller 12 is provided; it extends parallel to and above the guide roller 11 and is driven in rotation. The envelopes 1

positioned sequentially within the magazine 2 are advantageously loaded in the direction toward the transport roller 12 so that they are engaged by the transport roller 2 and supplied to the transport device 4. The transport roller 12 is embodied as a suction drum. However, it can also be provided with a friction coating in order to reliably engage the envelopes 1.

[0031] In the magazine 2 the envelopes 1 are arranged upright and are resting with a narrow side 13 on a support (not illustrated). The support is positioned advantageously at the same angle relative to the horizontal plane as the shafts 6, 7. The transport roller 12 engages the envelopes at their lower end and transports them into the gap 14 between the guide roller 10 and the transport belt 8. The spacing between this gap 14 and the envelopes 1 located in the magazine 2 is so great that the envelopes 1 upon transport through the transport roller 12 are reliably engaged by the guide roller 10 and the transport belt 8 and pulled into the gap 14. The envelope 1 is then transported between the transport belt 8 and the guide roller 10 in the direction toward the transport station 5. A stop (not illustrated) is provided where the envelopes 1 will come to rest with their narrow side 13. By means of the transport roller

12 the envelopes 1 can be transported in such short temporal intervals sequentially to the transport device 4 that the envelopes 1 in the transport station 5 are arranged with overlap. In the illustrated embodiment the overlap is only so great that the window 15 of the envelopes 1 is still visible in the transport station 5. However, it is also possible to provide the overlap to be greater so that the window 15 is only partially or not at all visible in the transport station. The transport station 5 has a corresponding support on which the envelopes 1 are supported with overlap in the illustrated embodiment. The lateral stop provided for the envelopes 1 in the transport station 5 ensures that the overlapped envelopes 1 will assume a precisely defined position relative to one another.

[0032] Since the shaft 9 of the transport device 4 is positioned at a slight slant relative to the shaft 7 and, accordingly, the transport belt 8 in the area between the lower shaft 7 and the shaft 9 is guided somewhat out of its plane, the respective envelope 1 upon transport through the device 4 is deformed minimally such that the closure flap 16 of the envelopes 1 is slightly lifted off the remaining part of the envelope. In this way, between the closure flap 16 and the remaining part of the envelope a free space or opening is

formed; during transport of the envelope 1 in the area between the guide roller 10 and the shaft 9, a catch rail (not illustrated) can engage the opening. This catch rail extends in the transport direction of the envelopes 1 in the area between the guide roller 10 and the shaft 9 in the transport device 4. By means of this catch rail, the closure flap 16 during transport in the transport station 5 is opened by 90 degrees. In the magazine 2 the closure flaps 16 are still closed and rest on the backside of the envelope 1, respectively. In this way, it is ensured that the envelopes 1 can be reliably and without problems transported out of the magazine 2. Once the area between the guide roller 10 and the shaft 9 is reached, the closure flaps 16 are opened by the catch rail in the described way. The twisted belt section 17 in the area between the guide roller 10 and the shaft 9 has such a length that the envelopes 1 are secured between the transport belt 8 and the guide roller 10 upon opening the closure flap 16 by means of the catch rail. In this way, it is ensured that the closure flaps 16 can be opened properly.

[0033] In the transport device 4 the envelopes 1 are transported in their longitudinal direction. With their narrow side 13 leading in the transport direction, the envelopes 1 collide

in the transport station 5 with the stop (not illustrated). Since the closure flaps 16 in the transport device 4 are folded open by the catch rail by only 90 degrees, the transport path from the guide roller 10 to the stop in the transport station 5 can be kept short. In this way, the envelopes 1 can be transported at very short time intervals sequentially into the transport station 5. The inserting device has thus a high output.

[0034] In the transport station 5, the partially opened envelopes are transported perpendicularly to their supply direction out of the inlet area 3 in the direction of arrow 18 (Fig. 1). For this additional transport at least two transport rollers 72, 73 are provided (Fig. 3); between them the envelope is transported, respectively. These transport rollers 72, 73 have a flat peripheral section 74. In the initial position the two transport rollers 72, 73 are arranged relative to one another such that their flat peripheral sections 74 are positioned opposite one another so that the envelope 1, coming from the transport belt 8 with its longitudinal edge leading in the transport direction 18, can move into this gap between the two transport rollers 72, 73. As soon as this envelope 1 contacts with its narrow side 13 the stop, the two transport rollers 72, 73 are driven such that

the envelope 1 is transported by them in the transport direction 18 in the transport station 5. In the described way, the rollers 72, 73 are rotatably driven in a cycled fashion. The transport path of the envelopes 1 from the transport device 4 into the transport station 5 is monitored by conventional sensors which send a signal to the transport rollers 72, 73 as soon as the narrow side 13 of the envelope 1 contacts the stop in the transport station 5. Now the transport rollers 72, 73 are driven in rotation and the envelope is transported in a cycled fashion out of the supply area of the transport device 4 in the transport direction 18. In this way, the envelopes 1 in this embodiment are transported sequentially by the transport rollers such in the transport direction 18 that they will be arranged in an overlap arrangement in the transport station 5.

[0035] During this transport of the envelopes 1 from the stop position into the overlap position, the closure flaps, initially opened by only 90 degrees, are opened mandatorily into the basic 180 degree position.

[0036] The open envelopes 1 are moved from the transport station 5 to a transport unit 19 (Fig. 3) which is arranged in the area underneath the transport station 5. The overlapped envelopes 1 according to this embodiment are en-

gaged by two transport roller pairs 20, 21 which are positioned in the transport direction 18 at a spacing sequentially behind one another. Their spacing from one another is smaller than the length of the envelope 1 so that the envelopes can be supplied reliably to the transport unit 19. The two transport roller pairs 20, 21 are positioned in a staggered arrangement in the vertical direction so that the envelopes 1 are transported at a slant downwardly in the transport direction 18. The closure flaps 16 are completely opened as the envelope 1 passes through the transport roller pairs 20, 21. After passing through the transport roller pair 20, the envelopes 1 reach the transport unit 19 which extends with one end into the vicinity of the transport roller pair 20 and with the other end into the vicinity of the feed units 43, 44. The transport unit 19 has at least one endless circulating transport element 22, preferably a transport band, which is guided about rotatably driven guide rollers 23, 24, 29. The guide roller 29 has such a minimal spacing from the transport roller pair 20 that the envelopes 1 are reliably transferred to the transport element 22.

[0037] The transport element 22 interacts with an endlessly circulating transport element 26 that is guided about two

guide rollers 25, 27. The transport element 26 can be in the form of a transport belt or transport band. Between the transport elements 22, 26, the envelopes 1, preferably overlapping one another, can be reliably transported and are entrained in the rotational direction 32. The guide roller 25 is positioned at a spacing and vertically staggered relative to the guide roller 27 that has a significantly larger diameter. The axes of the two guide rollers 25, 27 are positioned horizontally and parallel to one another. The transport belt 26 is guided about the guide roller 27 by more than 180 degrees.

[0038] The envelopes 1 are transported along the guide roller 27 upwardly to a transport unit 43. It has an endlessly circulating transport belt 34 (Fig. 3) which is deflected by two guide rollers 35, 36 positioned at a spacing relative to one another. At least one of these rollers is rotatably driven. The axes of the guide rollers 35, 36 that are positioned at the same level are parallel to one another and to the axis of the guide roller 27. In the area between the two guide rollers 35, 36 and above the upper run of the transport belt 34, two freely rotatable rollers 37, 38 are positioned at a spacing to one another. By means of the transport unit 33 the envelopes 1 are transported in the transport

direction 39 to a deflection device 40.

[0039] The guide roller 35 positioned adjacent to the guide roller 27 is arranged such that the envelope 1 which leaves the guide roller 27 is reliably transported onto the upper run of the transport belt 34. In this transfer area 41, conventional suction devices 83, 84 (Fig. 8a, 8b; 9a, 9b; 10a, 10b) are arranged with which the envelope 1 can be opened for insertion of an insert 42 in that the upper part 1' of the envelope is lifted off the lower part (see Fig. 8a).

[0040] In order to reliably secure the envelope for insertion of the insert 42 in its opened position, as illustrated in Figs. 8a, 8b, 9a, 9b, 10a, 10b, guide elements 81, 82 or 81', 82' can be pivoted additionally into the inner corner areas 85, 86 of the lateral edges of the envelope 1 held open by the suction devices 83 and 84. These guide elements, as can be seen in Figs. 11a to 11c and 12a to 12c, have a U-shaped cross-section or a V-shaped cross-section and are pivotable about rotational axes A1 and A2. The guide elements 81, 82; 81', 82' keep the opening of the envelope 1 tautly open during the insertion process wherein the curved areas of the U-shaped element or the edges of the V-shaped element are pushed into the inner corner areas 85, 86 off the lateral edges of the envelope 1 and in

this way the corner areas 85, 86 are opened farther than possible by means of the suction devices 83, 84 alone.

[0041] As soon as the insert has been inserted, the guide elements 81, 82; 81', 82' are slightly pivoted back (see Fig. 10b) simultaneously with relieving the suction devices 82, 84 in order to release the tension and in order to be able to transport the envelope 1 together with the insert 42 away from this position by means of the transport unit 33 without encountering any significant resistance. As soon as the envelope 1 has left the inserting station (inserting unit), the guide elements 81, 82, 81', 82' can be pivoted back into the initial position illustrated in Figs. 8a and 8b, they are then ready for being pivoted into the next envelope 1.

[0042] Examples for the concrete configuration of the guide elements 81, 82; 81', 82' are illustrated in Figs. 11a through 11c and 12a through 12c. While the guide elements 81, 82 according to Figs. 11a through 11c has a uniform U-shaped cross-section across its length, in the guide elements 81', 82' with a substantially V-shaped cross-section according to Figs. 12a to 12c the spacing of the legs of the V from one another decreases like a funnel in the direction toward the interior of the envelope.

[0043] The insert 42 can be comprised of a single sheet but can also be comprised of two or more sheets. For introducing these inserts 42 two feed units 43 and 44 are provided which are identical. The two feed units 43, 44 have endless circulating transport belts 45, respectively, which are guided about two guide rollers 46, 47 positioned at a spacing to one another. The feed unit 43 that is the upper one in the mounted position has at least one driver 48 provided on the transport belts 45 which projects transversely from the transport belt and engages the insert 42 at its trailing edge in the transport direction 39. By means of this driver 48 the insert is pushed into the open envelope 1 when it is just about to be released from the guide roller 27 and reaches the transport unit 33.

[0044] The supply unit 44 which is the lower one in the mounted position has also at least one driver 48 projecting transversely from the transport belts 45 and entrained by them. This driver 48 also engages the insert 42 at the edge which is trailing in the transport direction 39.

[0045] The lower supply unit 44 engages underneath the upper feed unit 43, when viewed in a plan view. The driver 48 on the transport belt 45 of the two feed units 43, 44 are arranged relative to one another such that they engage se-

quentially the respective insert 42 at the trailing end wherein the feed unit 43 takes over the insert from the feed unit 44 and pushes it into the open envelope 1. Accordingly, the rotational speed of the guide roller 27 as well as the transport speeds of the transport belts 45 of the feed units 43, 44 are matched to one another such that the insert 42 can be pushed into the envelope 1, respectively. The transport belt 45 of the feed units 43, 44 are driven endlessly in rotation. In the overlap area, the two feed units 43, 44 have such a spacing to one another that the drivers 48 do not contact the neighboring feed unit or its transport belts 45.

[0046] The feed units 43, 44 have separate drives and are monitored by torque sensors with great sensitivity. They stop the drives immediately when, as a result of torque monitoring, irregularities during the insertion process are recognized. In this way, the destruction of inserts 42 is prevented and in the case of disturbances only minimal manual actions are required in order to remove the cause of the disruption. The inserting process can then be continued according to schedule without there being a need for replacing or even re-manufacturing destroyed documents (inserts 42).

[0047] The envelopes 1 are transported by the transport unit 19 such that the closure flaps 16 point to the rear in the transport direction. In this way, the insertion opening for the inserts 42 in the transfer area 41 is pointing to the rear in the transport direction 39 so that the inserts can be reliably inserted into the envelopes. The inserts 42 are supplied continuously while the envelopes 1 are stopped for a brief moment for the insertion process. In this way, it is ensured that the inserts 42 are completely pushed into the envelope by the driver 48 of the feed devices before they are engaged by the transport roller 37 of the transport unit 33.

[0048] It is also possible to transport the envelopes from the magazine 2 via the inlet area 3, the transport station 5, and the transport unit individually and arrange them with overlap only upon entering the transfer area 41 to form a stack 80; this is illustrated in Fig. 6.

[0049] Moreover, it is possible to arrange the envelopes, received from the transport unit 19 in an imbricated overlap arrangement, to a stack 80 in the transfer area 41(Fig. 7) from which stack the envelopes are removed, stuffed with inserts and guided farther to the transport unit 33.

[0050] The transport rollers 37, 38 of the transport unit 33 have

a spacing which is matched to the measured length of the envelope 1 in the transport direction 39. In this way it is ensured that the envelopes 1 in the area between the transport rollers 37, 38 will not be released.

[0051] In the transport unit 33 the envelopes provided with the inserts 42 are supplied by means of the transport belts 34 and the transport rollers 37, 38 to a deflection device 40 which is driven about a horizontal axis 49 in a cycled fashion. The axis of rotation 49 is positioned parallel to the axes of the guide rollers 35, 36. The deflection device 40 is arranged such that it engaged the envelopes 42 filled with the inserts 42 already when the envelope is still held between the transport roller 38 and the transport belt 34. In this way, a safe transfer of the envelope 1 from the transport unit 33 to the deflection device 40 is ensured. Fig. 3 shows as an example how an envelope 1 with insert is positioned in one of the receptacles of the deflection device 40. As soon as this envelope has reached this receptacle, the deflection device 40 is rotated about its axis 49 by 90 degrees so that the initially horizontally positioned envelope 1 is moved into a vertical position. This envelope 1 is then further transported to a closure device 50 (Fig. 2) in which the closure flaps 16 of the en-

velope 1 are closed. Subsequently, the closed envelopes 1 are transported into a collecting station 51 where the closed envelopes are removed.

[0052] The deflection device 40 is star-shaped and has in the illustrated embodiment four transport and receiving units 52 which are staggered by 90 degrees relative to one another. They are identical and each have a transport device 53 (Fig. 5) which in the illustrated embodiment is an endless circulating suction belt. The transport devices 53 are guided about two guide rollers 54, 55. The guide roller 55 is fixedly mounted on a shaft 56. By means of the transport devices 53 the envelopes 1 are transported into the closing device 50 in a direction perpendicular to the feed direction 39 into the transport/receiving units 52, respectively. The shafts 56 are positioned radially relative to the axis of rotation 49 of the deflection device 40. On their radially inner end the shafts 56 are provided with a bevel gear 57. As illustrated in Figs. 4 and 5, the bevel gears 57, which are arranged at an angular spacing of 90 degrees about the axis of rotation 49, engage a common bevel gear 58 whose axis coincides with the axis of rotation 49 of the deflection device 40. This bevel gear 58 is mounted on a shaft 59 positioned perpendicularly to the shafts 56,

wherein the axis of the shaft 59 forms the axis of rotation 49 of the deflection device 40. The shaft 59 is driven in a cycled fashion by means of a servo motor such that the envelopes are transported reliably out of the receptacles.

[0053] The shaft 59 is surrounded at a spacing by a pipe 60 projecting on the side facing away from the bevel gear 58 past the transport devices 53. The shaft 59 itself projects past both ends of the pipe 60 as well as past the bevel gear 58. At the end projecting past the bevel gear 58, the shaft 59 is supported rotatably in bearing 61. At the other end a pulley 66 is mounted fixedly on the shaft 59 and is in driving connection by means of a belt with the servo motor (not illustrated).

[0054] The pipe 60 has longitudinal slots 62, 63 sequentially arranged at a minimal spacing in the axial direction by which air is sucked in, in a way to be described in the following, in order to secure the envelopes by means of the transport devices 53 and to transport them reliably. The pipe 60 surrounds at a spacing an inner pipe 64 which has slots 65 extending in the circumferential direction and arranged at the level of the longitudinal slots 62, 63 of the outer pipe 60 . The exterior pipe 60 is secured on a holder (not illustrated).

[0055] On the exterior pipe 60 arms 67, 68 are mounted at an angular spacing of 90 degrees relative to one another; they radially project from the exterior pipe 60 and are provided in pairs (Fig. 4). The arms 67 and 68 are positioned with minimal spacing opposite one another and delimit receptacles 69 for the envelopes 1. The arms 68 are bent at their radial outer ends at an obtuse angle so that in this area the receptacles 69 widen radially outwardly. In this way it is ensured that the envelopes 1 are reliably transported by the transport unit 33 (Fig. 3) into the receptacle 69 of the deflection device 40, respectively. The envelopes 1 rest in the receptacles 69 against the exterior pipe 60. Each receptacle 69 is delimited at one side by two arms 68 which in the axial direction of the shaft 59 are positioned at a spacing relative to one another (Fig. 5). The arms 67, 68 project radially past the transport devices 53 which extends in the axial direction of the shaft 59.

[0056] The inner pipe 64 is rotatably supported with its end neighboring the bevel gear 58 by means of at least one bearing 70, preferably a roller bearing, relative to the central shaft 59 and the exterior pipe 60. The inner shaft 59 with the bevel gear 58 can be rotated about its axis. Since the bevel gears 57 and the common bevel gear 58 are en-

gaged, by rotation of the bevel gear 58 all bevel gears 57 and thus the shafts 56 are rotated. In this way, all transport devices 53 are driven in circulation in the desired direction.

[0057] The exterior pipe 60 is provided at the end facing away from the bevel gear drive 57, 58 with a belt drive 71 with which the exterior pipe 60 and thus the entire deflection device 40 is rotated by means of a servo motor in a cycled fashion about the axis 49. In this way, the entire deflection device 40, as soon as the transport device 33 has transported the envelopes 1 into the receptacle 69, can be moved from the position according to Fig. 3 by 90 degrees in the clockwise direction. Accordingly, the receptacle containing the envelope 1 is moved into a vertical position while the following receptacles 69 is located in the feed area of the transport device 33 for receiving the next envelope. Upon rotation of the deflection device 40, the bevel gears 57 roll on the central bevel gear 58 so that the transport devices 53 are driven accordingly and the envelope 1 is transported farther in the direction toward the closing device 50. After this cycled rotation step is complete, the belt drive 71 is stopped. In order for the envelopes 1 to reach quickly the closing device 50, the shaft

59 is driven in rotation so that the bevel gears 57 are driven by means of the bevel gear 58 and the transport devices 53 are driven by means of the shafts 56. The envelope 1 contained in the receptacle 69 is thus transported by the corresponding transport device 53 into the closing device 50 (Fig. 2) where a transport device (not illustrated) is positioned with which the envelopes are transported farther. In this way, the deflection devices 40 are rotatably driven in a cycled fashion and the transport device 53 is driven for transporting the envelope 1 away. The transport devices 53 are advantageously suction belts which are configured such that the suction air reaches via the transport belts the envelopes 1 and pulls them against the transport belts. Since the exterior pipe 60 has the longitudinal slots 62, 63, which are provided at angular spacings of 90 degrees relative to one another, for each cycle rotation of the deflection device 40 the corresponding longitudinal slots 62, 63 are rotated by 90 degrees across the slots 56 in the interior pipe 64. The vacuum air which is generated via interior pipe 64 can thus reach only via the longitudinal slots 62, 63 in the area of the slots 65 the exterior and the corresponding suction belts 53. The other longitudinal slots 62, 63 of the exterior pipe 60 are

positioned in an area outside of the circumferential slots 65 of the inner pipe 64 so that these longitudinal slots are closed relative to the interior space of the interior pipe 64. The suction air can thus act only via the longitudinal slots 62, 63 arranged above the circumferential slots 65. In this way it is ensured that a sufficient vacuum is present in the receptacle 69 in which the envelope 1 to be transported to the closing device 50 is located.

[0058] In the illustrated embodiment, the receptacles 69 of the deflection device 40 are provided at an angular spacing of 90 degrees so that the deflection device 40 can be rotated in a cycled fashion by 90 degrees. In this way, the envelopes 1 can be transported sequentially into the individual receptacles 69 and, after rotation by 90 degrees, can be transported by actuation of the transport devices 53 farther perpendicularly to the feed device 39 (Fig. 3) into the closing device 50. The cycled rotation of the deflection device 40 and the drive of the transport device 53 can be advantageously also such that they overlap. This has the advantage that the envelopes 1 secured on the respective vacuum belts 53 are already partially transported into the receptacles 69 while the deflection device 40 is cycled by 90 degrees. The output of the entire inserting device is

increased because by means of the overlapped cycled rotation of the deflection device 40 and of the drive of the suction belts 53 the envelopes 1 can be sequentially transported with very minimal temporal intervals.

[0059] The deflection device 40 can also have fewer than four receptacles 69 but also more than four receptacles 69 so that the rotational angle of the deflection device 40 is accordingly varied. Moreover, the deflection device 40 can be used in all situations where articles must be deflected along their transport path. For example, the deflection device 40 can be used for inserts such as sheets or other flat articles which are to be deflected during their transport. In the embodiment, the defection is by 90 degrees. However, configurations of the deflection device 40 with different deflection angles is possible.

[0060] While specific embodiments of the invention have been shown and described in detail to illustrate the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.